ABSTRACT

An imaging device includes an array of plural imaging elements each of which is responsive to incident light flux to provide an output signal. Each of the imaging elements includes provision for conducting a variable time integration of incident light flux, and alternatively, also for selecting a time interval during which each of the imaging elements simultaneously conducts such a time integration of incident light flux (i.e., takes a snap shot of an image scene). The imaging device includes provision for random access of each image element or group of image elements in the array so that output signals indicative of all or of only selected parts of an imaged scene can be processed for their image information, if desired. The other parts of an imaged scene may not be considered or may be considered for their image information at a lower sampling rate than the selected parts of the scene so that image information about the selected parts of the image scene can be accessed at a much higher rate than is conventionally possible. A variable gain feature allows selective canceling of fixed-pattern noise, interference, or unwanted image information. An anti-blooming feature prevents charge from an excessively bright image source from cascading across the array. Also, a control cache memory allows control commands to be fed to the device at a high rate and to be implemented at a slower rate on a first-in, first-out basis.